

Maricopa County Policies and Procedures	Subject: Personal Protective Equipment	Number: A2207 Issue Date: 12/94
Approved: David R. Smith	Initiating Department: Risk Management	

A. Purpose

To provide for a consistent County-wide policy and adopt the Arizona Division of Occupational Safety and Health Standard(s) regarding personal protective equipment which provides for the safety and welfare of County employees. (The specific guidelines are contained in the appendices to this policy.)

B. Policy

1. In accordance with the established standards of the State of Arizona Occupational Safety and Health Act, protective equipment shall be provided, used, and maintained in a sanitary and reliable condition to protect employees from hazards arising from work processes, the environment, chemicals, radiological exposure, or mechanical irritants which, through absorption, inhalation, or physical contact may cause or is likely to cause injury, illness, or impair the functioning of any part of an employee's body.
2. Elected officials and department directors shall determine those specific tasks which require any item of personal protective equipment utilizing the guideline(s) contained in Appendices B and C of the appendices to this policy.
3. Additionally, each department shall establish written departmental policies and procedures as directed in 1910.132(d) through(f) of the Appendix A to this policy.
4. Personal, non-disposable protective equipment which cannot be re-issued because of sanitary and or health reasons (such as clothing worn next to the skin, safety shoes, prescription eye wear) shall be provided by the department or required to be furnished by the individual employee as determined by the elected official or department director. The department is required to provide prescription safety glasses based on the tasks performed and necessity as determined by the employee's eye care specialist. Cover-all goggles may be employed where full time prescription eye wear is not required
5. Personal protective equipment shall meet or exceed the standards referenced in the Arizona and or Federal, Occupational Safety and Health standards, rules, or other related guidelines considered to be authoritative. (See 1910.132 through 1910.138 of Appendix A to this policy.)

C. Definitions

References made in the appendices to the **"Safety Officer"** shall be the supervisor of an operation/function/activity.

D. Authority and Responsibility

Authority for this policy is contained in Arizona Revised Statutes, Title 23, Chapter 2, para. 23.403 and 23.404. (Arizona Safety and Health Act). See Federal Register, Vol. 59, No. 66, April 6, 1994, pg. 16334 - 16364.

E. Procedures

The procedures outlined in the attachment are adopted by reference and made a part of this policy. Additional assistance may be obtained from Risk Management, Loss Control Manager at 506-7179, as may be assigned from time to time.

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Appendices

Appendix A -- General Requirements

Appendix B -- Guidelines for Hazard Assessment and PPE Selection

Appendix C -- Workplace Hazard Assessment and Certification

Appendix D -- Certificate of Training

APPENDIX A TO A2207, Personal Protective Equipment

General Requirements. 1910.132

- (a) **Application.** Protective equipment, including personal protective equipment for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers, shall be provided, used, and maintained in a sanitary and reliable condition wherever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact.
- (b) **Employee-owned equipment.** Where employees provide their own protective equipment, the employer shall be responsible to assure its adequacy, including proper maintenance, and sanitation of such equipment.
- (c) **Design.** All personal protective equipment shall be of safe design and construction for the work to be performed.
- (d) **Hazard assessment and equipment selection.**
 - (1) The employer shall assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment (PPE). If such hazards are present, or likely to be present, the employer shall:
 - (i) Select, and have each affected employee use, the types of PPE that will protect the affected employee from the hazards identified in the hazard assessment;
 - (ii) Communicate selection decisions to each affected employee; and,
 - (iii) Select PPE that properly fits each affected employee.

Note: Appendix B contains procedures that would comply with the requirement for a hazard assessment.
 - (2) The employer shall verify that the required workplace hazard assessment has been performed through a written certification that identifies the workplace evaluated; the person certifying that the evaluation has been performed; the date(s) of the hazard assessment; and, which identifies the document as a certification of hazard assessment. (Appendix C or equivalent may be used for this requirement.)
- (e) **Defective and damaged equipment.** Defective or damaged personal protective equipment shall not be used.
- (f) **Training.**
 - (1) The employer shall provide training to each employee who is required by this section to use PPE. Each such employee shall be trained to know at least the following:
 - (i) When PPE is necessary;
 - (ii) What PPE is necessary;

- (iii) How to properly don, doff, adjust, and wear PPE;
 - (iv) The limitations of the PPE; and,
 - (v) The proper care, maintenance, useful life and disposal of the PPE.
- (2) Each affected employee shall demonstrate an understanding of the training specified in paragraph (f)(1) of this section, and the ability to use PPE properly, before being allowed to perform work requiring the use of PPE.
- (3) When the employer has reason to believe that any affected employee who has already been trained does not have the understanding and skill required by paragraph (f)(2) of this section, the employer shall retrain each such employee. Circumstances where retraining is required include, but are not limited to, situations where:
 - (i) Changes in the workplace render previous training obsolete; or
 - (ii) Changes in the types of PPE to be used render previous training obsolete; or
 - (iii) Inadequacies in an affected employee's knowledge or use of assigned PPE indicate that the employee has not retained the requisite understanding or skill.
- (4) The employer shall verify that each affected employee has received and understood the required training through a written certification that contains the name of each employee trained, the date(s) of training, and the subject of the certification. (See Appendix D.)

Eye and Face Protection. 1910.133

(a) General requirements.

- (1) Each affected employee shall use appropriate eye or face protection when exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.
- (2) Each affected employee shall use eye protection that provides side protection when there is a hazard from flying objects. Detachable side protectors (e.g. clip-on or slide-on side shields) meeting the pertinent requirements of this section are acceptable.
- (3) Each affected employee who wears prescription lenses while engaged in operations that involve eye hazards shall wear eye protection that incorporates the prescription in its design, or shall wear eye protection that can be worn over the prescription lenses without disturbing the proper position of the prescription lenses or the protective lenses.
- (4) Eye and face PPE shall be distinctly marked to facilitate identification of the manufacturer.
- (5) Each affected employee shall use equipment with filter lenses that have a shade number appropriate for the work being performed for protection from injurious light radiation. The following is a listing of appropriate shade numbers for various operations. Filter Lenses for Protection Against Radiant Energy.

(b) Criteria for protective eye and face devices.

- (1) Protective eye and face devices purchased after July 5, 1994 shall comply with ANSI Z87.1-1989, "American National Standard Practice for Occupational and Educational Eye and Face Protection," which is incorporated by reference, or shall be demonstrated by the employer to be equally effective. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from the American National Standards Institute. Copies may be inspected at the Docket Office, Occupational Safety and Health Administration, U.S. Department of Labor, 200 Constitution Ave., N.W. room N2634, Washington, D.C. or at the Office of the Federal Register, 800 North Capitol Street NW., suite 700, Washington, DC.
- (2) Eye and face protective devices purchased before July 5, 1994 shall comply with the ANSI "USA standard for Occupational and Educational Eye and Face Protection," Z87.1-1968 or shall be demonstrated by the employer to be equally effective. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be inspected at the Docket Office, Occupational Safety and Health Administration, U.S. Department of Labor, 200 Constitution Ave., N.W. room N2634, Washington, D.C. or at the Office of the Federal Register, 800 North Capitol Street NW., suite 700, Washington, DC.

Table 1 - Filter Lenses

Operations	Electric Size 1/32 in.	Arc Current	Minimum* Protective Shade
Gas metal arc welding and flux cored arc welding	Less than 3 3-5 5--8 More than 8	Less than 60 60-160 160-250 250-550	7 8 10 11
Gas metal arc welding and cored arc welding		Less than 60 60-160 160-250 250-500	7 10 10 10
Gas tungsten arc welding		Less than 50 50-150 150-500	8 8 10
Air carbon arc cutting	(Light) (Heavy)	Less than 500 .500-1000	10 11
Plasma arc welding		Less than 20 20-100 100-400 400-800	6 8 10 11
Plasma arc cutting	(light)** (Medium)** (Heavy)**	Less than 300 300-400 400-800	8 9 10
Torch brazing Torch soldering Carbon arc welding			3 2 14

Table 2 - Filter Lens

Operations	Plate Thickness in inches	Plate Thickness in mm	Minimum* Protective Shade
Gas Welding Light Medium Heavy	Under 1/8 1/8 to 1/2 Over 1/2	Under 3.2 3.2 to 12.7 Over 12.7	4 5 6
Oxygen cutting Light Medium Heavy	Under 1 1 to 6 Over 6	Under 25 25 to 150 Over 150	3 4 5

* As a rule of thumb, start with a shade that is too dark to see the weld zone. Then go to a lighter shade which gives sufficient view of the weld zone without going below the minimum. In oxy-fuel gas welding or cutting where the torch produces a high yellow light, it is desirable to use a filter lens that absorbs the yellow or sodium line in the visible light of the (spectrum) operation.

** These values apply where the actual arc is clearly seen. Experience has shown that lighter filters may be used when the arc is hidden by the workpiece.

Respiratory Protection. 1910.134

(a) Permissible practice.

- (1) In the control of those occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, mists, sprays, or vapors, the primary objective shall be to prevent atmospheric contamination. This shall be accomplished as far as feasible by accepted engineering control measures (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials). When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators shall be used pursuant to the following requirements.
- (2) Respirators shall be provided by the employer when such equipment is necessary to protect the health of the employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended. The employer shall be responsible for the establishment and maintenance of a respiratory protective program which shall include the requirements outlined in paragraph (b) of this section.
- (3) The employee shall use the provided respiratory protection in accordance with instructions and training received.

(b) Requirements for a minimal acceptable program.

- (1) Written standard operating procedures governing the selection and use of respirators shall be established.
- (2) Respirators shall be selected on the basis of hazards to which the worker is exposed.
- (3) The user shall be instructed and trained in the proper use of respirators and their limitations.
- (4) [Reserved for future use.]
- (5) Respirators shall be regularly cleaned and disinfected. Those used by more than one worker shall be thoroughly cleaned and disinfected after each use.
- (6) Respirators shall be stored in a convenient, clean, and sanitary location.
- (7) Respirators used routinely shall be inspected during cleaning. Worn or deteriorated parts shall be replaced. Respirators for emergency use such as self-contained devices shall be thoroughly inspected at least once a month and after each use.
- (8) Appropriate surveillance of work area conditions and degree of employee exposure or stress shall be maintained.
- (9) There shall be regular inspection and evaluation to determine the continued effectiveness of the program.
- (10) Persons should not be assigned to tasks requiring use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. The local physician shall determine what health and physical conditions are pertinent. The respirator user's medical status should be reviewed periodically (for instance, annually).
- (11) Respirators shall be selected from among those jointly approved by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health under the provisions of 30 CFR part 11.

(c) Selection of respirators. Proper selection of respirators shall be made according to the guidance of American National Standard Practices for Respiratory Protection Z88.2-1969.

(d) **Air quality.**

- (1) Compressed air, compressed oxygen, liquid air, and liquid oxygen used for respiration shall be of high purity. Oxygen shall meet the requirements of the United States Pharmacopoeia for medical or breathing oxygen. Breathing air shall meet at least the requirements of the specification for Grade D breathing air as described in Compressed Gas Association Commodity Specification G-7.1-1966. Compressed oxygen shall not be used in supplied-air respirators or in open circuit self-contained breathing apparatus that have previously used compressed air. Oxygen must never be used with air line respirators.
- (2) Breathing air may be supplied to respirators from cylinders or air compressors.
 - (i) Cylinders shall be tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR Part 178).
 - (ii) The compressor for supplying air shall be equipped with necessary safety and standby devices. A breathing air-type compressor shall be used. Compressors shall be constructed and situated so as to avoid entry of contaminated air into the system and suitable in-line air purifying sorbent beds and filters installed to further assure breathing air quality. A receiver of sufficient capacity to enable the respirator wearer to escape from a contaminated atmosphere in event of compressor failure, and alarms to indicate compressor failure and overheating shall be installed in the system. If an oil lubricated compressor is used, it shall have a high-temperature or carbon monoxide alarm, or both. If only a high temperature alarm is used, the air from the compressor shall be frequently tested for carbon monoxide to insure that it meets the specifications in paragraph (d)(1) of this section.
- (3) Air line couplings shall be incompatible with outlets for other gas systems to prevent inadvertent servicing of air line respirators with nonrespirable gases or oxygen.
- (4) Breathing gas containers shall be marked in accordance with American National Standard Method of Marking Portable Compressed Gas Containers to Identify the Material Contained, Z48.1-1954; Federal Specification BB-A-1034a, June 21, 1968, Air, Compressed for Breathing Purposes; or Interim Federal Specification GG-B-00675b, April 27, 1965, Breathing Apparatus, Self-Contained.

(e) **Use of respirators.**

- (1) Standard procedures shall be developed for respirator use. These should include all information and guidance necessary for their proper selection, use, and care. Possible emergency and routine situations should be anticipated and planned for.
- (2) The correct respirator shall be specified for each job. The respirator type is usually specified in the work procedures by a qualified individual supervising the respiratory protective program. The individual issuing them shall be adequately instructed to insure that the correct respirator is issued.
- (3) Written procedures shall be prepared covering safe use of respirators in dangerous atmospheres that might be encountered in normal operations or in emergencies. Personnel shall be familiar with these procedures and the available respirators.
 - (i) In areas where the wearer, with failure of the respirator, could be overcome by a toxic or oxygen-deficient atmosphere, at least one additional man shall be present. Communications (visual, voice, or signal line) shall be maintained between both or all individuals present. Planning shall be such that one individual will be unaffected by any likely incident and have the proper rescue equipment to be able to assist the other(s) in case of emergency.
 - (ii) When self-contained breathing apparatus or hose masks with blowers are used in atmospheres immediately dangerous to life or health, standby men must be present with suitable rescue equipment.
 - (iii) Persons using air line respirators in atmospheres immediately hazardous to life or health shall be equipped with safety harnesses and safety lines for lifting or removing persons from hazardous

atmospheres or other and equivalent provisions for the rescue of persons from hazardous atmospheres shall be used. A standby man or men with suitable self-contained breathing apparatus shall be at the nearest fresh air base for emergency rescue.

- (4) Respiratory protection is no better than the respirator in use, even though it is worn conscientiously. Frequent random inspections shall be conducted by a qualified individual to assure that respirators are properly selected, used, cleaned, and maintained.
- (5) For safe use of any respirator, it is essential that the user be properly instructed in its selection, use, and maintenance. Both supervisors and workers shall be so instructed by competent persons. Training shall provide the men an opportunity to handle the respirator, have it fitted properly, test its face-piece-to-face seal, wear it in normal air for a long familiarity period, and, finally, to wear it in a test atmosphere.
 - (i) Every respirator wearer shall receive fitting instructions, including demonstrations and practice in how the respirator should be worn, how to adjust it, and how to determine if it fits properly. Respirators shall not be worn when conditions prevent a good face seal. Such conditions may be a growth of beard, sideburns, a skull cap that projects under the face piece, or temple pieces on glasses. Also, the absence of one or both dentures can seriously affect the fit of a face piece. The worker's diligence in observing these factors shall be evaluated by periodic check. To assure proper protection, the face piece fit shall be checked by the wearer each time he puts on the respirator. This may be done by following the manufacturer's face piece fitting instructions.
 - (ii) Providing respiratory protection for individuals wearing corrective glasses is a serious problem. A proper seal cannot be established if the temple bars of eye glasses extend through the sealing edge of the full face piece. As a temporary measure, glasses with short temple bars or without temple bars may be taped to the wearer's head. Wearing of contact lenses in contaminated atmospheres with a respirator shall not be allowed. Systems have been developed for mounting corrective lenses inside full face pieces. When a workman must wear corrective lenses as part of the face piece, the face piece and lenses shall be fitted by qualified individuals to provide good vision, comfort, and a gas-tight seal.
 - (iii) If corrective spectacles or goggles are required, they shall be worn so as not to affect the fit of the facepiece. Proper selection of equipment will minimize or avoid this problem.

(f) **Maintenance and care of respirators.**

- (1) A program for maintenance and care of respirators shall be adjusted to the type of plant, working conditions, and hazards involved, and shall include the following basic services:
 - (i) Inspection for defects (including a leak check),
 - (ii) Cleaning and disinfecting,
 - (iii) Repair,
 - (iv) Storage.
- (2) Equipment shall be properly maintained to retain its original effectiveness.
 - (i) All respirators shall be inspected routinely before and after each use. A respirator that is not routinely used but is kept ready for emergency use shall be inspected after each use and at least monthly to assure that it is in satisfactory working condition.
 - (ii) Self-contained breathing apparatus shall be inspected monthly. Air and oxygen cylinders shall be fully charged according to the manufacturer's instructions. It shall be determined that the regulator and warning devices function properly.
 - (iii) Respirator inspection shall include a check of the tightness of connections and the condition of the facepiece, headbands, valves, connecting tube, and canisters. Rubber or elastomer parts shall be inspected for pliability and signs of deterioration. Stretching and manipulating rubber or elastomer

parts with a massaging action will keep them pliable and flexible and prevent them from taking a set during storage.

- (iv) A record shall be kept of inspection dates and findings for respirators maintained for emergency use.
- (3) Routinely used respirators shall be collected, cleaned, and disinfected as frequently as necessary to insure that proper protection is provided for the wearer. Respirators maintained for emergency use shall be cleaned and disinfected after each use.
- (4) Replacement or repairs shall be done only by experienced persons with parts designed for the respirator. No attempt shall be made to replace components or to make adjustment or repairs beyond the manufacturer's recommendations. Reducing or admission valves or regulators shall be returned to the manufacturer or to a trained technician for adjustment or repair.
- (5)
 - (i) After inspection, cleaning, and necessary repair, respirators shall be stored to protect against dust, sunlight, heat, extreme cold, excessive moisture, or damaging chemicals. Respirators placed at stations and work areas for emergency use should be quickly accessible at all times and should be stored in compartments built for the purpose. The compartments should be clearly marked. Routinely used respirators, such as dust respirators, may be placed in plastic bags. Respirators should not be stored in such places as lockers or tool boxes unless they are in carrying cases or cartons.
 - (ii) Respirators should be packed or stored so that the facepiece and exhalation valve will rest in a normal position and function will not be impaired by the elastomer setting in an abnormal position.
 - (iii) Instructions for proper storage of emergency respirators, such as gas masks and self-contained breathing apparatus, are found in "use and care" instructions usually mounted inside the carrying case lid.

(g) **Identification of gas mask canisters.**

- (1) The primary means of identifying a gas mask canister shall be by means of properly worded labels. The secondary means of identifying a gas mask canister shall be by a color code.
- (2) All who issue or use gas masks falling within the scope of this section shall see that all gas mask canisters purchased or used by them are properly labeled and colored in accordance with these requirements before they are placed in service and that the labels and colors are properly maintained at all times thereafter until the canisters have completely served their purpose.
- (3) On each canister shall appear in bold letters the following:
 - (i) Canister for(Name for atmospheric contaminant) or Type N Gas Mask Canister
 - (ii) In addition, essentially the following wording shall appear beneath the appropriate phrase on the canister label: "For respiratory protection in atmospheres containing not more than ----- percent by volume of -----." (Name of atmospheric contaminant)
- (4) Canisters having a special high- efficiency filter for protection against radionuclides and other highly toxic particulates shall be labeled with a statement of the type and degree of protection afforded by the filter. The label shall be affixed to the neck end of, or to the gray stripe which is around and near the top of the canister. The degree of protection shall be marked as the percent of penetration of the canister by a 0.3-micron-diameter dioctyl phthalate (DOP) smoke at a flow rate of 85 liters per minute.
- (5) Each canister shall have a label warning that gas masks should be used only in atmospheres containing sufficient oxygen to support life (at least 16 percent by volume), since gas mask canisters are only designed to neutralize or remove contaminants from the air.

- (6) Each gas mask canister shall be painted a distinctive color or combination of colors indicated in Table I-1. All colors used shall be such that they are clearly identifiable by the user and clearly distinguishable from one another. The color coating used shall offer a high degree of resistance to chipping, scaling, peeling, blistering, fading, and the effects of the ordinary atmospheres to which they may be exposed under normal conditions of storage and use. Appropriately colored pressure sensitive tape may be used for the stripes.

Table I-1 - Canister Identification

Atmospheric contaminants to be protected against Colors assigned	
Acid Gases..... Hydrocyanic acid gas.....	White. White with 1/2 inch green stripe completely around the canister near the bottom.
Chlorine gas.....	White with 1/2-inch yellow stripe completely around the canister near the bottom.
Organic vapors..... Ammonia gas..... Acid gas and Ammonia gas.....	Black. Green. Green with 1/2--inch white stripe completely around the canister near the bottom.
Carbon monoxide..... Acid gases and organic vapors. Hydrocyanic acid gas and chloropicrin vapor.....	Blue. Yellow. Yellow with 1/2-inch blue stripe completely around the canister near the bottom. Brown
Acid gases, organic vapors, and ammonia gases..... Radioactive materials, excepting tritium and noble gases..... Particulates (dusts, fumes, mists, fogs, or smoke) in combination with any of the above gases or vapors.....	Purple (Magenta) Canister color for contaminant, as designated above, with 1/2-inch gray stripe completely around the canister near the top. Red with 1/2-inch gray stripe completely around the canister near the top.
All of the above atmospheric contaminants.....	

Gray shall not be assigned as the main color for a canister designed to remove acids or vapors.

Note: Orange shall be used as a complete body, or stripe color to represent gases not included in this table. The user will need to refer to the canister label to determine the degree of protection the canister will afford.

Head Protection 1910.135

(a) General requirements.

- (1) Each affected employee shall wear protective helmets when working in areas where there is a potential for injury to the head from falling objects.
- (2) Protective helmets designed to reduce electrical shock hazard shall be worn by each such affected employee when near exposed electrical conductors which could contact the head.

(b) Criteria for protective helmets.

- (1) Protective helmets purchased after July 5, 1994 shall comply with ANSI Z89.1-1986, "American National Standard for Personnel Protection - Protective Headwear for Industrial Workers-Requirements," which is incorporated by reference, or shall be demonstrated to be equally effective. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be inspected at the Docket Office, Occupational Safety and Health Administration, U.S. Department of Labor, 200 Constitution Ave., N.W. room N2634, Washington, D.C. or at the Office of the Federal Register, 800 North Capitol Street NW., suite 700, Washington, DC.
- (2) Protective helmets purchased before July 5, 1994 shall comply with the ANSI standard "American National Standard Safety Requirements for Industrial Head Protection," ANSI Z89.1-1969, or shall be demonstrated by the employer to be equally effective. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be inspected at the Docket Office, Occupational Safety and Health Administration, U.S. Department of Labor, 200 Constitution Ave., N.W. room N2634, Washington, D.C. or at the Office of the Federal Register, 800 North Capitol Street NW., suite 700, Washington, DC.

Foot Protection. 1910.136

- (a) **General requirements.** Each affected employee shall wear protective footwear when working in areas where there is a danger of foot injuries due to falling and rolling objects, or objects piercing the sole, and where such employee's feet are exposed to electrical hazards.

(b) Criteria for protective footwear.

- (1) Protective footwear purchased after July 5, 1994 shall comply with ANSI Z41-1986, "American National Standard for Personnel Protection - Protective Footwear" which is incorporated by reference, or shall be demonstrated to be equally effective. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C 552(a) and 1 CFR part 51. Copies may be inspected at the Docket Office, Occupational Safety and Health Administration, U.S. Department of Labor, 200 Constitution Ave., N.W. room N2634, Washington, D.C. or at the Office of the Federal Register, 800 North Capitol Street NW., suite 700, Washington, DC.
- (2) Protective footwear purchased before July 5, 1994 shall comply with the ANSI standard "USA Standard for Men's Safety-Toe Footwear," Z41.1-1967, which is incorporated by reference, or shall be demonstrated to be equally effective. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C 552(a) and 1 CFR part 51. Copies may be inspected at the Docket Office, Occupational Safety and Health Administration, U.S. Department of Labor, 200 Constitution Ave., N.W. room N2634, Washington, D.C. or at the Office of the Federal Register, 800 North Capitol Street NW., suite 700, Washington, DC.

Hand Protection. 1910.138

- (a) **General requirements.** Employers shall select and require employees to use appropriate hand protection when employees' hands are exposed to hazards such as those from skin absorption of harmful substances; severe cuts or lacerations; severe abrasions; punctures chemical burns; thermal burns; and harmful temperature extremes.
- (b) **Selection.** Employers shall base the selection of the appropriate hand protection on an evaluation of the performance characteristics of the hand protection relative to the task(s) to be performed, conditions present, duration of use, and the hazards and potential hazards identified.

Appendix B to A2207, Personal Protective Equipment

Guidelines for Hazard Assessment and Personal Protective Equipment Selection.

This Appendix is intended to provide compliance assistance for employers and employees in implementing requirements for a hazard assessment and the selection of personal protective equipment.

1. **Controlling hazards.** PPE devices alone should not be relied on to provide protection against hazards, but should be used in conjunction with guards, engineering controls, and sound manufacturing practices.
2. **Assessment and selection.** It is necessary to consider certain general guidelines for assessing the foot, head, eye and face, and hand hazard situations that exist in an occupational or educational operation or process, and to match the protective devices to the particular hazard. It should be the responsibility of the safety officer to exercise common sense and appropriate expertise to accomplish these tasks.
3. **Assessment guidelines.** In order to assess the need for PPE the following steps should be taken:
 - a. **Survey.** Conduct a walk-through survey of the areas in question. The purpose of the survey is to identify sources of hazards to workers and co-workers. Consideration should be given to the basic hazard categories:
 - (a) Impact
 - (b) Penetration
 - (c) Compression (roll-over)
 - (d) Chemical
 - (e) Heat
 - (f) Harmful dust
 - (g) Light (optical) radiation
 - b. **Sources.** During the walk-through survey the safety officer should observe;
 - (a) sources of motion; i.e., machinery or processes where any movement of tools, machine elements or particles could exist, or movement of personnel that could result in collision with stationary objects;
 - (b) sources of high temperatures that could result in burns, eye injury or ignition of protective equipment, etc.;
 - (c) types of chemical exposures;
 - (d) sources of harmful dust;
 - (e) sources of light radiation, i.e., welding, brazing, cutting, furnaces, heat treating, high intensity lights, etc.;
 - (f) sources of falling objects or potential for dropping objects;
 - (g) sources of sharp objects which might pierce the feet or cut the hands;
 - (h) sources of rolling or pinching objects which could crush the feet;
 - (i) layout of workplace and location of co-workers; and
 - (j) any electrical hazards. In addition, injury/accident data should be reviewed to help identify problem areas.

- c. **Organize data.** Following the walk-through survey, it is necessary to organize the data and information for use in the assessment of hazards. The objective is to prepare for an analysis of the hazards in the environment to enable proper selection of protective equipment.
 - d. **Analyze data.** Having gathered and organized data on a workplace, an estimate of the potential for injuries should be made. Each of the basic hazards (paragraph 3.a.) should be reviewed and a determination made as to the type, level of risk, and seriousness of potential injury from each of the hazards found in the area. The possibility of exposure to several hazards simultaneously should be considered.
4. **Selection guidelines.** After completion of the procedures in paragraph 3, the general procedure for selection of protective equipment is to:
- a) Become familiar with the potential hazard(s) that is present, and what it can do; i.e., splash protection, impact protection, etc.;
 - b) compare the hazards associated with the environment; i.e., impact velocities, masses, projectile shape, radiation intensities, with the capabilities of the available protective equipment;
 - c) select the protective equipment which ensures a level of protection greater than the minimum required to protect employees from the hazards; and
 - d) fit the user with the protective device and give instructions on care and use of the PPE. It is very important that end users be made aware of all warning labels for and limitations of their PPE.
5. **Fitting the device.** Careful consideration must be given to comfort and fit. PPE that fits poorly will not afford the necessary protection. Continued wearing of the device is more likely if it fits the wearer comfortably. Protective devices are generally available in a variety of sizes. Care should be taken to ensure that the right size is selected.
6. **Devices with adjustable features.** Adjustments should be made on an individual basis for a comfortable fit that will maintain the protective device in the proper position. Particular care should be taken in fitting devices for eye protection against dust and chemical splash to ensure that the devices are sealed to the face. In addition, proper fitting of helmets is important to ensure that it will not fall off during work operations. In some cases a chin strap may be necessary to keep the helmet on an employee's head. to prevent a strangulation hazard). Where manufacturer's instruction are available, they should be followed carefully.
7. **Reassessment of hazards.** It is the responsibility of the safety officer to reassess the workplace hazard situation as necessary, by identifying and evaluating new equipment and processes, reviewing accident records, and reevaluating the suitability of previously selected PPE.
8. **Selection chart guidelines for eye and face protection.** Some occupations (not a complete list) for which eye protection should be routinely considered are: carpenters, electricians, machinist, mechanics and repairers, millwrights, plumbers and pipe fitters, sheet metal workers and tinsmiths, assemblers, sanders, grinding machine operators, lathe and milling machine operators, sawyers, welders, laborers, chemical process operators and handlers, and timber cutting and logging workers. The following chart provides general guidance for the proper selection of eye and face protection to protect against hazards associated with the listed hazard "source" operations.

Eye and Face Protection Selection Chart

Source	Assessment of Hazard	Protection
IMPACT - Chipping, Grinding machining masonry work, woodworking, sawing, drilling, chiseling, powered fastening, riveting, and sanding.	Flying fragments, objects, large chips, particles sand, dirt, etc.	Spectacles with side protection, goggles, face shields. See notes(1),(3),, (5), (6), (10). For severe exposure, use face shield.
HEAT - Furnace operations, pouring casting, hot dipping, and welding.	Hot sparks. Splash from. molten metals High temperature. exposure.	Face shields, goggles, spectacles with side protection. For severe exposure use face shield. See notes (1), (2), (3). Face shields worn over goggles. See note (1), (2), (3). Screen face shields, reflective face shields. See notes (1), (2), (3).
CHEMICALS - Acid and chemicals handling, degreasing plating.	Splash.... Irritating mist..	Goggles, eyecup and types. For severe exposure, use face shield. See notes (3),(11) Special-purpose goggles.
DUST - Woodworking, buffing, general dusty conditions	Nuisance dust	Goggles, eyecup and cover types. See note (8)

Notes to Eye and Face Protection Selection Chart.

- (1) Care should be taken to recognize the possibility of multiple and simultaneous exposure to a variety of hazards. Adequate protection against the highest level of each of the hazards should be provided. Protective devices do not provide unlimited protection.
- (2) Operations involving heat may also involve light radiation. As required by the standard, protection from both the hazards must be provided.
- (3) Face shields should only be worn over primary eye protection(spectacles or goggles).
- (4) As required by the standard, filter lenses must meet the requirements for shade designations in 1910.133(a)(5). Tinted and shaded lenses are not filter lenses unless they are marked or identified as such.
- (5) As required by the standard, persons whose vision requires the use of prescription (Rx) lenses must wear either protective devices fitted with prescription (Rx) lenses or protective devices designed to be worn over regular prescription (Rx) eye wear.
- (6) Wearers of contact lenses must also wear appropriate eye and face protection devices in a hazardous environment. It should be recognized that dusty and/or chemical environments may represent an additional hazard to contact lens wearers.
- (7) Caution should be exercised in the use of metal frame protective devices in electrical hazard areas.
- (8) Atmospheric conditions and the restricted ventilation of the protector can cause lenses to fog. Frequent cleansing may be necessary.
- (9) Welding helmets or face shields should be used only over primary eye protection (spectacles or goggles).
- (10) Non-side shield spectacles are available for frontal protection only, but are not acceptable eye protection for the sources and operations listed for "impact."
- (11) Ventilation should be adequate, but well protected from splash entry. Eye and face protection should be designed and used so that it provides both adequate ventilation and protects the wearer from splash entry.
- (12) Protection from light radiation is directly related to filter lens density. See note (4). Select the darkest shade that allows task performance.

9. Selection guidelines for head protection.

All head protection (helmets) is designed to provide protection from impact and penetration hazards caused by falling objects. Head protection is also available which provides protection from electric shock and provides protection from electric shock and burn. When selecting head protection, knowledge of potential electrical hazards is important. Class A helmets, in addition to impact and penetration resistance, provide electrical protection from low-voltage conductors (they are proof tested to 2,200 volts). Class B helmets, in addition to impact and penetration resistance, provide electrical protection from high-voltage conductors (they are proof tested to 20,000 volts). Class C helmets provide impact and penetration resistance (they are usually made of aluminum which conducts electricity), and should not be used around electrical hazards.

Where falling object hazards are present, helmets must be worn. Some examples include: working below other workers who are using tools and materials which could fall; working around or under conveyor belts which are carrying parts or materials; working below machinery or processes which might cause material or objects to fall; and working on exposed energized conductors.

Some examples of occupations for which head protection should be routinely considered are: carpenters, electricians, linemen, mechanics and repairers, plumbers and pipe fitters, assemblers, packers, wrappers, sawyers, welders, laborers, freight handlers, timber cutting and logging stock handlers, and warehouse laborers.

10. Selection guidelines for foot protection.

Safety shoes and boots which meet the ANSI Z41-1991 Standard provide both impact and compression protection. Where necessary, safety shoes can be obtained which provide puncture protection. In some work situation, metatarsal protection should be provided, and in other special situation electrical conductive or insulating safety shoes would be appropriate.

Safety shoes or boots with impact protection would be required for carrying or handling materials such as packages, objects, parts or heavy tools, which could be dropped; and, for other activities where objects might fall onto the feet. Safety shoes or boots with compression protection would be required for work activities involving skid trucks (manual material handling carts) around bulk rolls (such as paper rolls) and around heavy pipes, all of which could potentially roll over an employee's feet. Safety shoes or boots with puncture protection would be required where sharp objects such as nails, wire, tacks, screws, large staples, scrap metal etc., could be stepped on by employees causing a foot injury.

Some occupations (not a complete list) for which foot protection should be routinely considered are: shipping and receiving clerks, stock clerks, carpenters, electricians, machinist, mechanics and repairers, plumbers and pipe fitters, structural metal workers, assemblers, drywall installers and lathers, packers, wrappers, craters, punch and stamping press operators, sawyers, welders, laborers, freight handlers, gardeners and grounds-keepers, timber cutting and logging workers, stock handlers and warehouse laborers.

11. Selection guidelines for hand protection.

Gloves are often relied upon to prevent cuts, abrasions, burns, and skin contact with chemicals that are capable of causing local or systemic effects following dermal exposure. OSHA is unaware of any gloves that provide protection against all potential hand hazards, and commonly available glove materials provide only limited protection against many chemicals. Therefore, it is important to select the most appropriate glove for a particular application and to determine how long it can be worn, and whether it can be reused.

It is also important to know the performance characteristics of gloves relative to the specific hazard anticipated; e.g., chemical hazards, cut hazards, flame hazards, etc. These performance characteristics should be assessed by using standard test procedures. Before purchasing gloves, the employer should request documentation from the manufacturer that the gloves meet the appropriate test standard(s) for the hazard(s) anticipated. Other factors to be considered for glove selection in general include:

- (A) As long as the performance characteristics are acceptable, in certain circumstances, it may be more cost effective to regularly change cheaper gloves than to reuse more expensive types; and ,

- (B) The work activities of the employee should be studied to determine the degree of dexterity required, the duration, frequency, and degree of exposure of the hazard, and the physical stresses that will be applied.

With respect to selection of gloves for protection against chemical hazards:

- (A) The toxic properties of the chemical(s) must be determined; in particular, the ability of the chemical to cause local effects on the skin and / or to pass through the skin and cause systemic effects;
- (B) Generally, any "chemical resistant" glove can be used for dry powders;
- (C) For mixtures and formulated products (unless specific test data are available), a glove should be selected on the basis of the chemical component with the shortest breakthrough time, since it is possible for solvents to carry active ingredients through polymeric materials; and,
- (D) Employees must be able to remove the gloves in such a manner as to prevent skin contamination.

12. **Cleaning and maintenance.** It is important that all PPE be kept clean and properly maintained. Cleaning is particularly important for eye and face protection where dirty or fogged lenses could impair vision. For the purposes of compliance with 1910.132(a) and (b), PPE should be inspected, cleaned, and maintained at regular intervals so that the PPE provides the requisite protection. It is also important to ensure that contaminated PPE which cannot be decontaminated is disposed of in a manner that protects employees from exposure to hazards.

Appendix C to A2207, Personal Protective Equipment
WORKPLACE HAZARD ASSESSMENT AND
CERTIFICATION

Location:

Facility: _____
Street Address: _____
City/Town: _____

POTENTIAL HAZARD(S) KEY

1=Impact Hazard
2=Penetration Hazard
3=Compression Hazard--rollover
4=Chemical Hazard
5=Heat Hazard
6=Harmful Dusts/Fumes
7=Light-Radiation/Illumination
8=Noise Exposure
9=Other Hazard_____

PERSONAL PROTECTIVE EQUIPMENT (PPE) CODES

A=Aprons
B=Cotton Clothing
C=DustMask
D=Face Shields
E=Safety Glasses
F=Gloves
G=Goggles
H=Hard Hat
I=Hearing Protection

J=Metatarsel Covers
K=Overalls
L=Protective Clothing
M=Reflective Vests
N=Respirators
O=Safety Belt/Harness
P=Steel Toe Shoes
Q=Welding Glasses/Hoods
R=Other *describe on line below*

POTENTIAL HAZARD
Use Number Code
(check all that apply)

LIST PPE
USED-use letter

YES

NO

		Abrasive blasting	1	2	3	4	5	6	7	8	
		Acid/Alkali cleaning	1	2	3	4	5	6	7	8	
		Adhesive bonding	1	2	3	4	5	6	7	8	
		Asbestos handling	1	2	3	4	5	6	7	8	
		Assembly operations	1	2	3	4	5	6	7	8	
		Brazing	1	2	3	4	5	6	7	8	
		Carpentry	1	2	3	4	5	6	7	8	
		Cleaning with solvents	1	2	3	4	5	6	7	8	
		Cleaning/sanitizing activities	1	2	3	4	5	6	7	8	
		Concrete work	1	2	3	4	5	6	7	8	
		Confined space	1	2	3	4	5	6	7	8	
		Construction activities	1	2	3	4	5	6	7	8	
		Degreasing/solvent cleaning	1	2	3	4	5	6	7	8	
		Demolition activities	1	2	3	4	5	6	7	8	
		Drilling/machining	1	2	3	4	5	6	7	8	
		Electrical maintenance/repair	1	2	3	4	5	6	7	8	
		Equipment maintenance/ repair	1	2	3	4	5	6	7	8	
		Excavation	1	2	3	4	5	6	7	8	
		Fertilizer application	1	2	3	4	5	6	7	8	
		First aid response	1	2	3	4	5	6	7	8	
		Fluorescent light bulb replace	1	2	3	4	5	6	7	8	
		Fueling operations	1	2	3	4	5	6	7	8	
		Furniture/fixture repair	1	2	3	4	5	6	7	8	
		Gardening /yard work	1	2	3	4	5	6	7	8	
		Grinding activities	1	2	3	4	5	6	7	8	
		Hazardous Waste handling	1	2	3	4	5	6	7	8	
		Heavy equipment operation	1	2	3	4	5	6	7	8	
		Herbicide application	1	2	3	4	5	6	7	8	
		Hot Work	1	2	3	4	5	6	7	8	
		HVAC servicing	1	2	3	4	5	6	7	8	
		Hydraulic lift work	1	2	3	4	5	6	7	8	
		Insecticide Application	1	2	3	4	5	6	7	8	
		Ionizing radiation (i.e.X-ray)	1	2	3	4	5	6	7	8	
		Jackhammer operation	1	2	3	4	5	6	7	8	
		Laboratory operations	1	2	3	4	5	6	7	8	
		Landscaping operations	1	2	3	4	5	6	7	8	
		Lifting/moving 50 lbs or more	1	2	3	4	5	6	7	8	
		Materials handling (warehouse)	1	2	3	4	5	6	7	8	
		Materials repair	1	2	3	4	5	6	7	8	
		Metal machining	1	2	3	4	5	6	7	8	
		Packaging	1	2	3	4	5	6	7	8	
		Painting - airless spray	1	2	3	4	5	6	7	8	
		Painting - compressed air	1	2	3	4	5	6	7	8	
		Painting - roller/brush	1	2	3	4	5	6	7	8	
		Pesticide application	1	2	3	4	5	6	7	8	
		Platform lift work	1	2	3	4	5	6	7	8	

		Plumbing - maintenance/repair
		Polishing/buffing
		Printing
		RF/Microwave maint./repair
		Roofing (roof repairs)
		Sharpen blades
		Sheet metal work
		Shipping/receiving
		Soldering/brazing
		Sprinkler sys maint./repair
		Tree trimming
		Water main repair
		Welding arc
		Welding - simple gas
		Wood working

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1	2	3	4	5	6	7	8	

I certify that I performed the above **WORKPLACE HAZARD ASSESSMENT** on_____19__.

Name of Supervisor/Safety Officer

**Appendix D to A2207, Personal Protective Equipment
CERTIFICATE OF TRAINING**

I hereby verify that on _____ 19__,*

_____ has received and understands:
name of employee

1. When _____ is necessary;
name of PPE

2. What _____ is necessary;
name of PPE

3. How to properly don, doff, adjust, and wear _____;
name of PPE

4. The limitations of the _____, and,
name of PPE

5. The proper care, maintenance, useful life and disposal of the _____.
name of PPE

EMPLOYEE Signature

Signature

SUPERVISOR/SAFETY OFFICER

*This certificate expires one year from this date.